



## **Summary of Fishery Surveys Fisher Lake, Iron County, 2013**

### **Survey Description**

The Mercer DNR Fisheries Management Team conducted the following fishery surveys on Fisher Lake in 2013: early-spring fyke netting (May 6 – 10 and May 13 – 16; 33 net-nights of sampling effort) and electrofishing (May 10; 2.8 miles of shoreline surveyed), late-spring electrofishing (June 3; 5.9 miles of shoreline surveyed), early-summer fyke netting (June 10 – June 12; 8 net-nights of sampling effort), and early-summer angling (June 18). Walleye and muskellunge were the primary species targeted during the early-spring surveys, however, samples of the northern pike, black crappie, and yellow perch populations were also obtained. Bass and panfish populations were targeted for assessment during the late-spring electrofishing survey (bass were also targeted during the angling survey for additional insight into population structure), and the early summer netting survey provided supplemental information about the panfish populations. Quality, preferred, and memorable sizes referenced in this summary are based on standard proportions of world record lengths developed for each species by the American Fisheries Society.

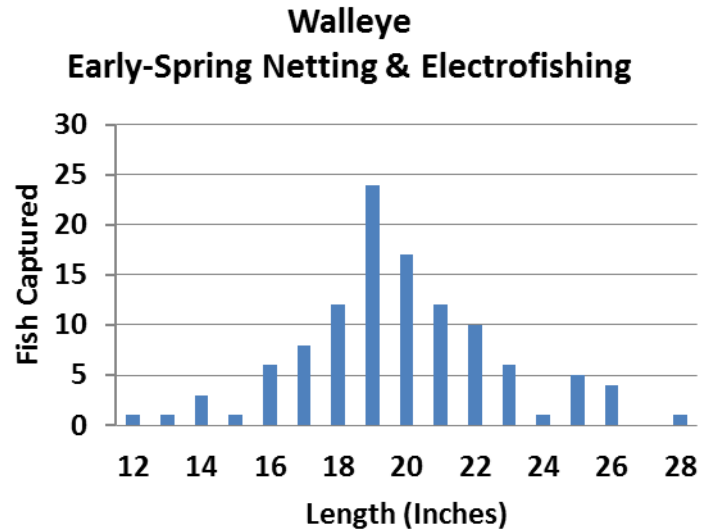
### **Habitat Characteristics**

Fisher Lake is a 482-acre drainage lake (maximum and mean depths of 28 and 9 feet, respectively) with medium brown-stained water and low to moderate water clarity (Secchi disk transparency measurements averaging around 5 feet; WDNR citizen lake monitoring data 2012-2013). The littoral zone (near-shore area where light is able to penetrate to the lake bottom) substrates are comprised primarily of sand and muck, with limited areas of gravel and some rubble. Aquatic vegetation is at moderate levels; however, in some shallow water bays it is quite extensive. Nutrient analyses (e.g., phosphorus) have typically shown that Fisher Lake is moderately productive (mesotrophic). Fisher Lake water levels (which typically range about 2 feet during the fall drawdown and spring refill periods) are regulated by the Shay dam located on the Turtle River outlet. A public boat landing with limited parking is available.

## Walleye



Adult Population Estimate = 0.6/acre	
Quality Size $\geq 15''$	96%
Preferred Size $\geq 20''$	50%
Memorable Size $\geq 25''$	9%

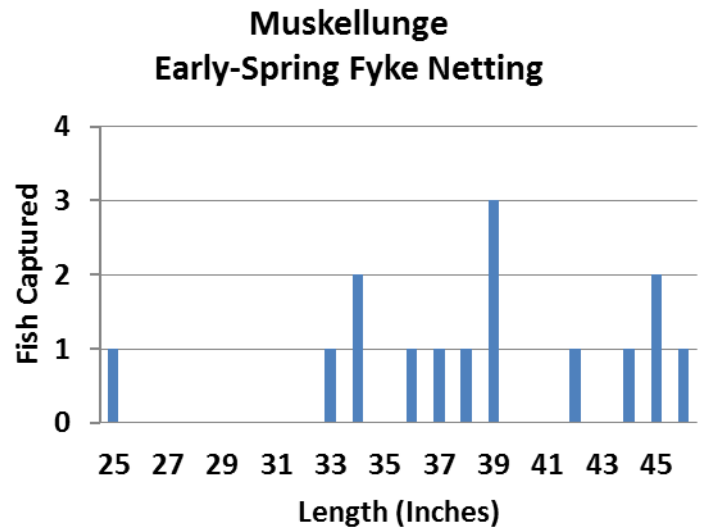


We captured 112 individual walleyes during the early-spring netting and electrofishing surveys at rates of 7.2/net-night and 5.2/mile, respectively. Using mark-recapture techniques, the population estimate for adult walleye in 482-acre Fisher Lake was 267 fish, or 0.6 fish per surface acre of water. It appears that the Fisher Lake walleye population has been sustained almost entirely on past stockings, hence the adult walleye density (0.6 fish per acre) was well below the typical northern Wisconsin range for naturally-reproducing populations (2-5 adults per acre). The size structure of the population is considered good, although it is indicative of a population that experiences very low recruitment of young fish.

## Muskellunge



Captured 0.7 per net-night $\geq 20''$	
Quality Size $\geq 30''$	93%
Preferred Size $\geq 38''$	60%
Memorable Size $\geq 42''$	33%

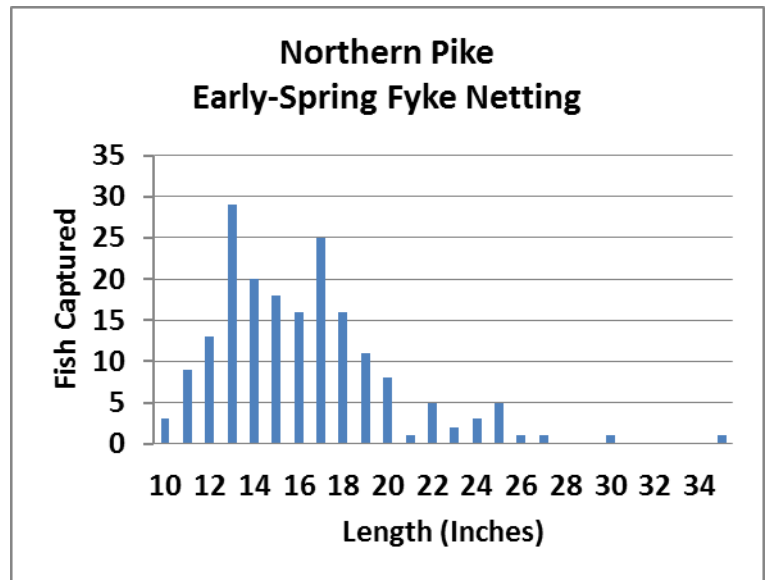


Muskellunge  $\geq 20$  inches were captured at a moderate rate (0.7 per net-night) during the early-spring netting surveys. However, it should be noted that during the musky-targeted netting (when timing was optimal and habitats typically selected by muskellunge were sampled) muskellunge were captured at a higher rate (1.4 per net-night). Fisher Lake is classified as a Class A2 muskellunge fishery, and the catch rate we observed is near average when compared to other Class A2 fisheries. Size structure of the population sample is considered to be very good, with a relatively high proportion of fish being of a desirable size to anglers.

### Northern Pike



Captured 11.2 per net-night $\geq 14''$	
Quality Size $\geq 21''$	15%
Preferred Size $\geq 28''$	1%

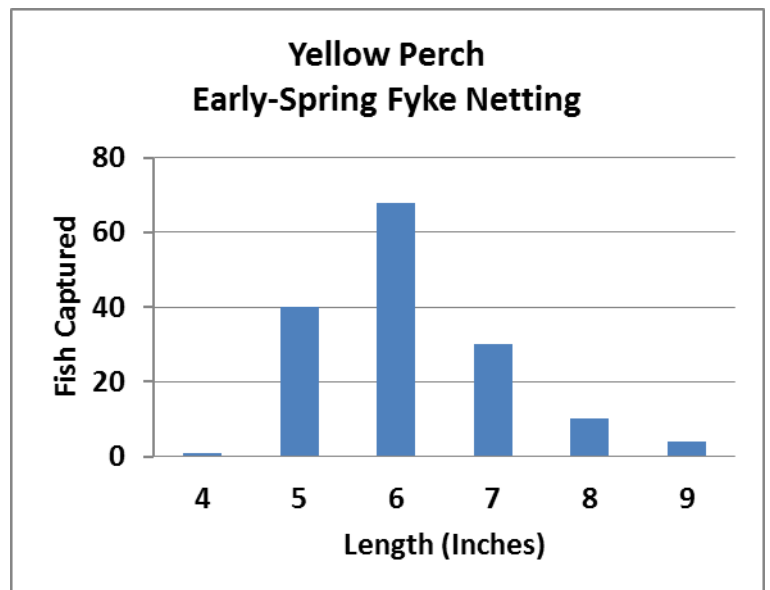


Although our nets were not set specifically to target northern pike, we caught them at a moderately high rate (11.2 per net-night) during the early-spring netting survey. Size distribution in our sample was considered poor (despite the fact that a couple larger pike were captured) and is comparable to pike size structure in similar lake-types.

### Yellow Perch



Captured 30.7 per net-night $\geq 5''$	
Quality Size $\geq 8''$	9%
Preferred Size $\geq 10''$	0%



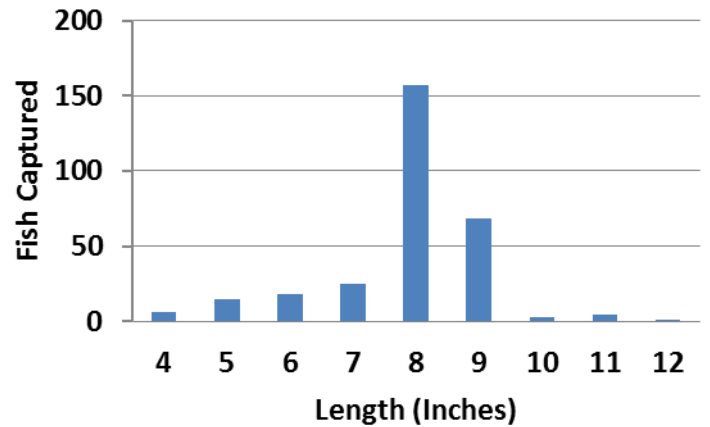
Yellow perch  $\geq 5$  inches were captured at a moderate rate (30.7 per net-night) during the early-spring fyke netting survey. Size structure of the population sample is considered poor, with few fish of an acceptable size to anglers.

### Black Crappie



Captured 26.4 per net-night $\geq 5''$	
Quality Size $\geq 8''$	80%
Preferred Size $\geq 10''$	3%

### Black Crappie Early-Spring Fyke Netting



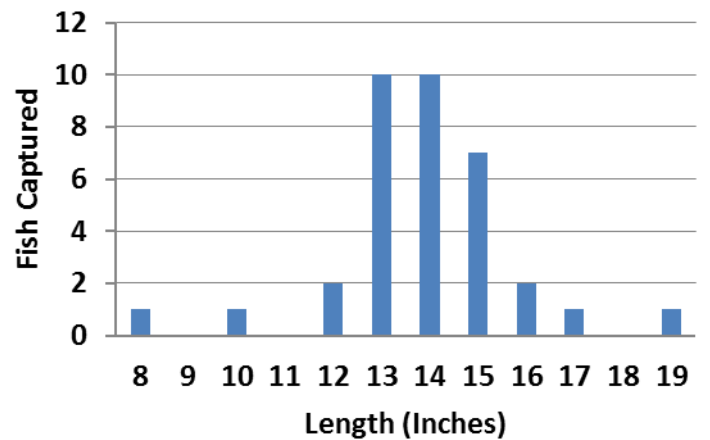
Black crappies were captured at a moderately high rate (26.4 per net-night) during the early-spring fyke netting survey. Size structure of the population sample is considered fair; however, a very low proportion of fish were of preferred size. In support of these findings on the black crappie population, the early-summer fyke netting survey yielded a similar size distribution.

### Largemouth Bass



Captured 5.9 per mile $\geq 8''$	
Quality Size $\geq 12''$	94%
Preferred Size $\geq 15''$	31%

### Largemouth Bass Late-Spring Electrofishing

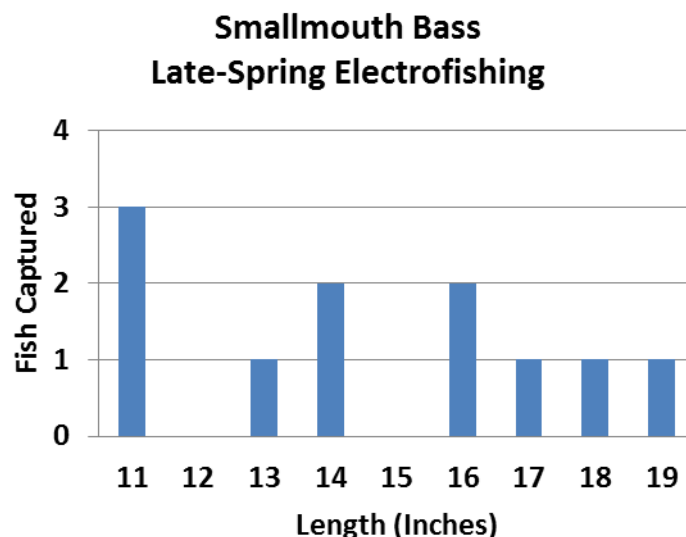


Largemouth bass  $\geq 8$  inches were captured at a relatively low rate (5.9 per mile) during the late-spring electrofishing survey. Size structure of the population sample is considered good, with nearly a third of the fish observed at preferred size. In support of these findings, we also captured largemouth bass at a low to moderate rate and a nearly identical size structure during the early-summer angling survey.

### Smallmouth Bass



Captured 1.9 per mile $\geq 7''$	
Quality Size $\geq 11''$	100%
Preferred Size $\geq 14''$	64%
Memorable Size $\geq 17''$	27%

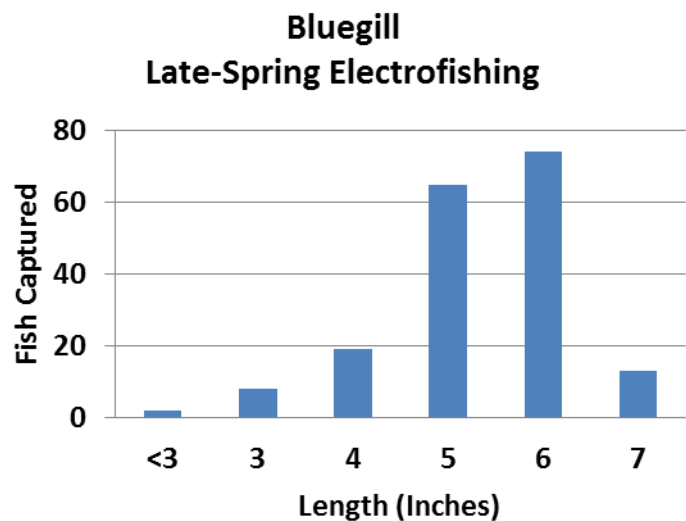


Smallmouth bass  $\geq 7$  inches were captured at a low rate (1.9 per mile) during the late-spring electrofishing survey. Size structure of the population sample is considered very good, with nearly two-thirds of the fish observed at preferred size.

### Bluegill



Captured 179 per mile $\geq 3''$	
Quality Size $\geq 6''$	49%
Preferred Size $\geq 8''$	0%

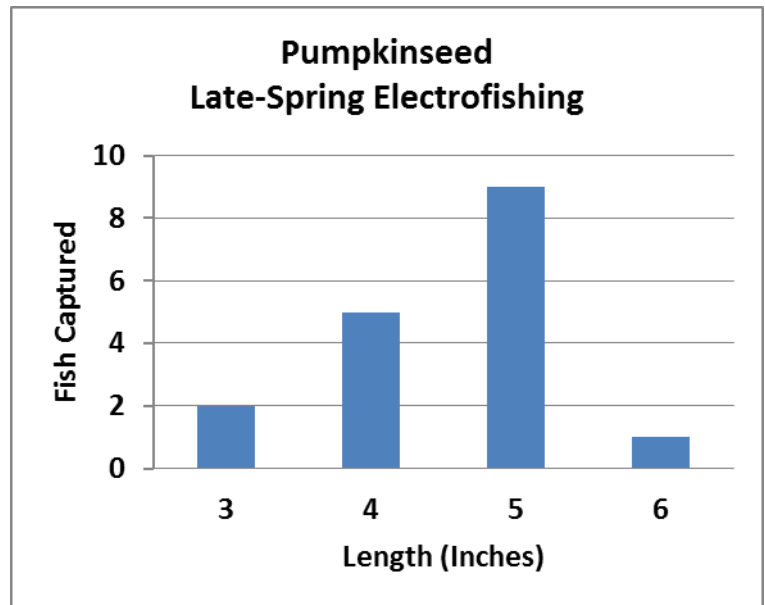


Bluegills  $\geq 3$  inches were captured at a relatively high rate (179 per mile) during the late-spring electrofishing survey. The size distribution of our sample was fair; however few fish exceeded 7 inches in length. In support of these findings, bluegills  $\geq 3$  inches were captured at a relatively high rate and somewhat similar size distribution (greater percentage of quality size fish but none over 8 inches) during the early-summer fyke netting survey.

### Pumpkinseed



Captured 17 per mile $\geq 3''$	
Quality Size $\geq 6''$	6%
Preferred Size $\geq 8''$	0%



Pumpkinseeds  $\geq 3$  inches were captured at a low rate of 17 per mile during the late-spring electrofishing survey. The size structure of the population sample was poor, with no fish being of an acceptable size to anglers. In support of these findings on the pumpkinseed population, the early-summer fyke netting survey yielded similar results.

### Conclusions

Fisher Lake currently displays characteristics of a fish community suffering from predator-prey imbalance, with relatively high numbers of panfish (especially bluegill and crappie) and low numbers of predators capable of controlling them (walleye and largemouth bass). As a result of high panfish abundance and competition for limited food, slow growth rate is assumed (analyses pending) to be a contributing factor in the poor panfish size distributions.

In addition, it appears that abundant northern pike may be eating or competing with other predators (largemouth bass and walleye) known to better control bluegill and crappie. Pike have been shown to selectively prey upon slender-bodied fishes (particularly yellow perch and white suckers, but also game fish such as largemouth bass and walleye) rather than deep-bodied sunfishes that are more difficult to capture and swallow. Data from several area lakes with similar physical, chemical, and fish community characteristics suggest that over-abundance of small northern pike is detrimental to the entire fish community.

Despite past efforts to establish a self-sustaining walleye population in Fisher Lake, very little natural reproduction (survival to first fall) of walleyes has been documented over the past 20 years. Efforts to promote the establishment of a self-sustaining population have included habitat enhancement (a rock spawning reef in 1997), stockings of small and large fingerlings, and even adult walleye transfers from another lake. Natural reproduction does occur in nearby Cedar Lake, and we have documented migration of Fisher Lake walleyes upstream into Cedar. Therefore, it is likely that some walleyes from Cedar Lake have also migrated downstream to maintain low adult populations in Catherine and Fisher Lakes. But unless conditions change, anglers can expect difficulty catching walleyes in Fisher Lake; and we encourage voluntary release while we explore strategies to improve fish community balance and the fishery in an upcoming management plan.

The muskellunge population in Fisher Lake appears to be relatively healthy and offers a quality fishing opportunity. Our fyke net catch was comprised primarily of larger individuals, which suggests that recruitment of young fish into the population has been low in recent years – typical of lakes with over-abundant northern pike. Nevertheless, natural reproduction of muskellunge has been documented in Fisher Lake during past surveys, including a recent 2012 electrofishing survey. We have also documented natural muskellunge recruitment in Cedar Lake upstream, so it is likely that some muskellunge have migrated downstream into Fisher from Cedar.

The poor size distribution of northern pike in our sample is consistent with our observation that pike (a coolwater species) typically grow slowly and fail to reach older ages or preferred sizes when large numbers of them must share food and space in relatively shallow, warmwater systems. Abundant Fisher Lake pike are forced to spend too much time at water temperatures above their physiological optimum range. Anglers should expect consistent angling action for northern pike on Fisher Lake and are encouraged to harvest their daily bag limit to promote a reduction in pike numbers.

The shallow, weedy habitat areas of Fisher Lake seem favorable for largemouth bass, so our capture rate was lower than expected. Predation by over-abundant pike may be suppressing the survival of young bass. In sufficient numbers, largemouth bass can be effective predators on deep-bodied prey such as bluegill and black crappie in lakes without vast areas of open-water refuge for young panfish to escape to. However, the relatively low number of largemouth bass currently in Fisher Lake cannot be expected to keep young panfish thinned out, growing fast, and attaining sizes acceptable to anglers. Smallmouth bass numbers were at even lower numbers than largemouth bass, however, this matched expectations based upon the limited amounts of their preferred habitats (rocky areas) harboring their preferred prey (crayfish). Anglers are encouraged to voluntarily release all bass as we explore strategies to improve fish community balance.

Rock bass, shorthead redhorse, white sucker, and golden shiner were other species captured during our surveys.

This report includes only recent survey findings and limited management recommendations. More detailed management recommendations, after considering these survey results along with historical survey information, will be incorporated into a Fisher-Catherine-Cedar Lakes Fishery Management Plan (public visioning session completed by Jeff Roth and Dave Neuswanger July 30, 2005) being developed this year.

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